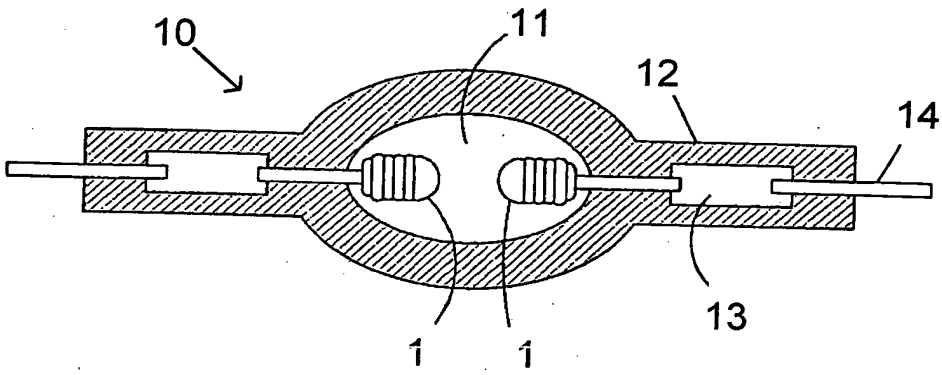


Fig. 1(a)

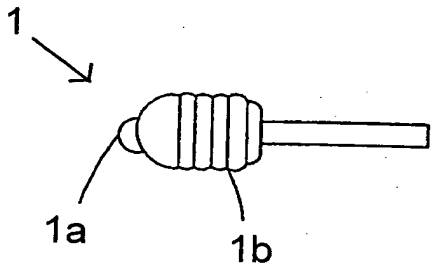


Fig. 1(b)

Fig. 2

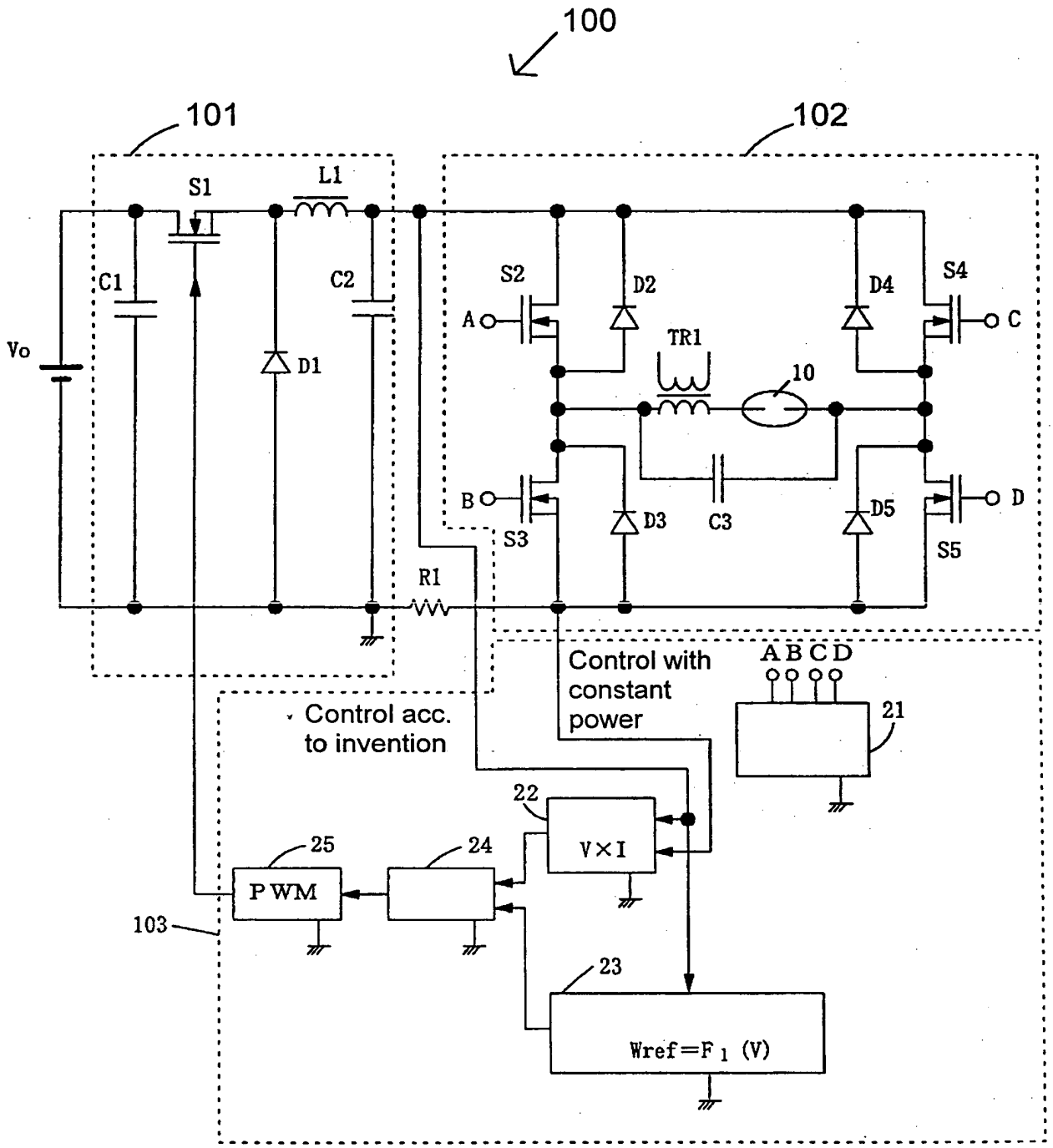

100
101
102
S1
L1
C1
C2
Vo
D1
S2
D2
A
D4
S4
C
TR1
10
B
S3
D3
C3
D5
D
S5
R1
Control with constant power
A B C D
21
Control acc. to invention
22
V×I
25
24
PWM
103
23
Wref=F 1 (V)

Fig. 3

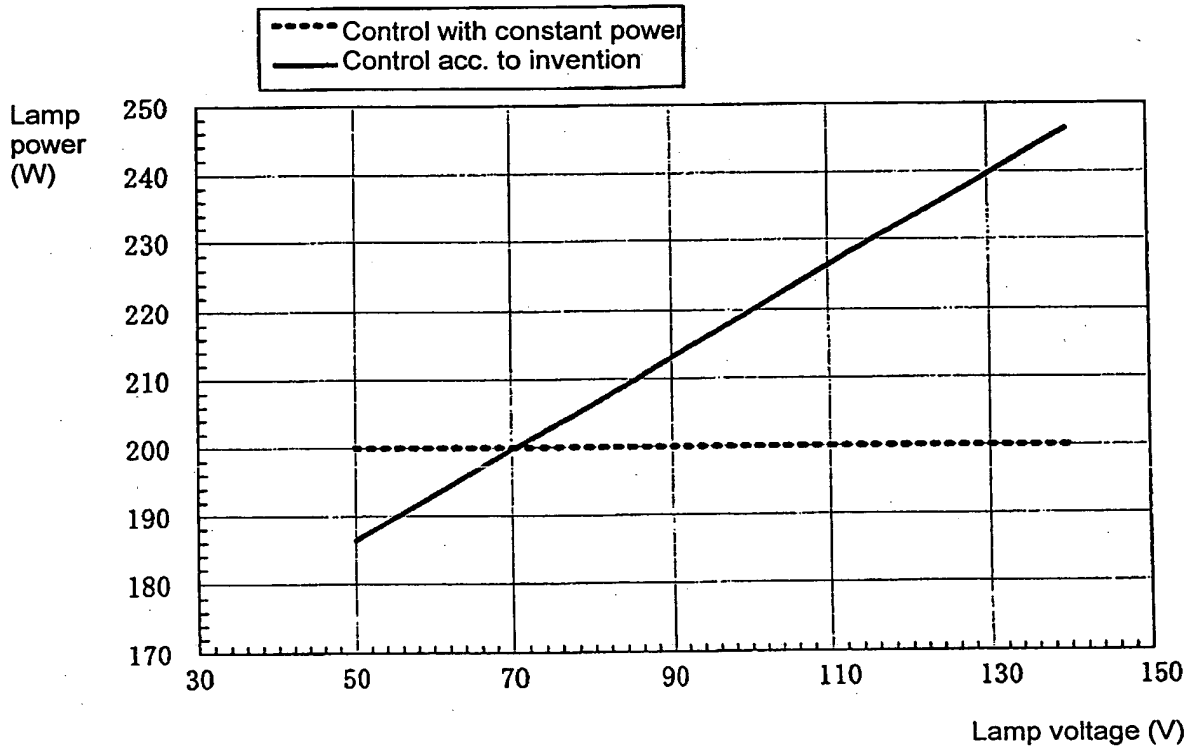

Control with constant power
Control acc. to invention
Lamp power (W)
250
240
230
220
210
200
190
180
170
30
50
70
90
110
130
150
Lamp voltage (V)

Fig. 4

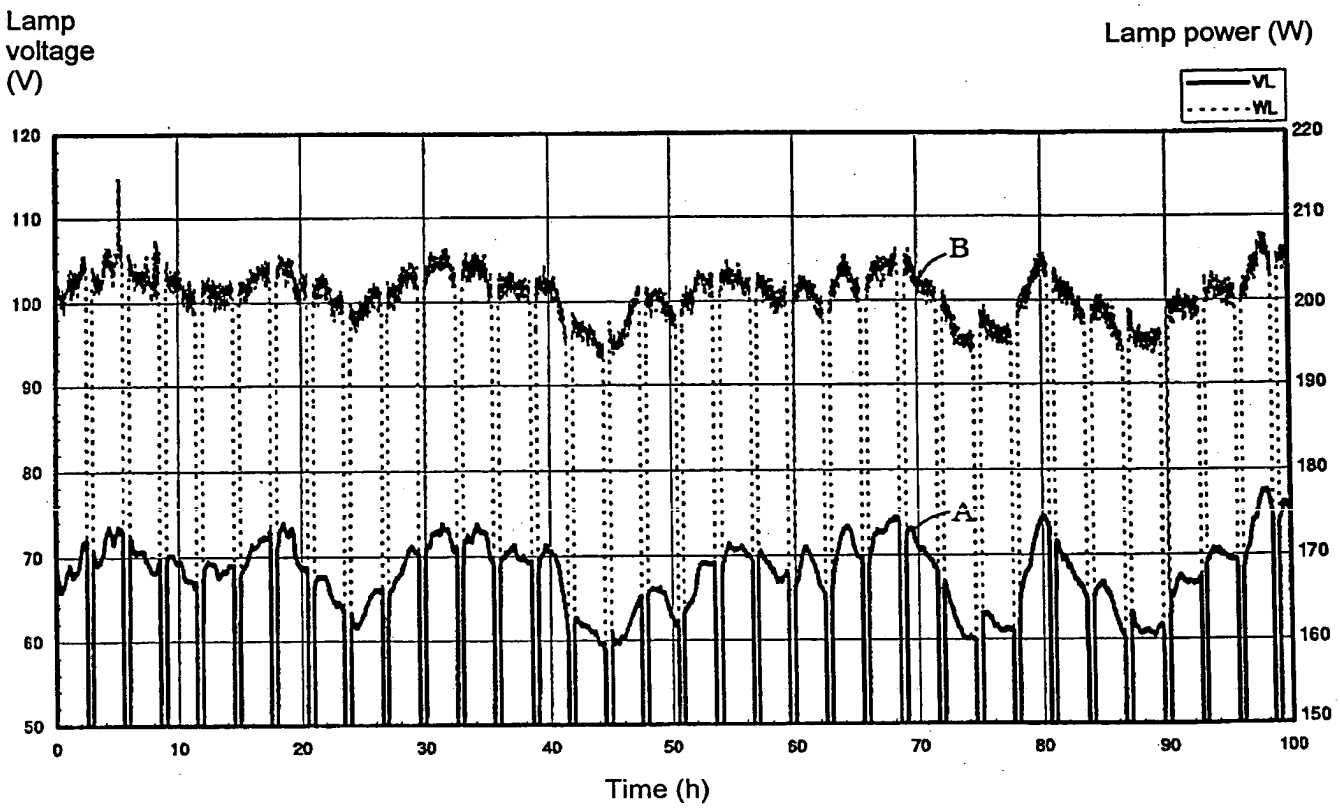

Lamp voltage (V)
Lamp power (W)
VL
WL
120
110
100
90
80
70
60
50
220
210
200
190
180
170
160
150
B
A
0
10
20
30
40
50
60
70
80
90
100
Time (h)

Fig. 5

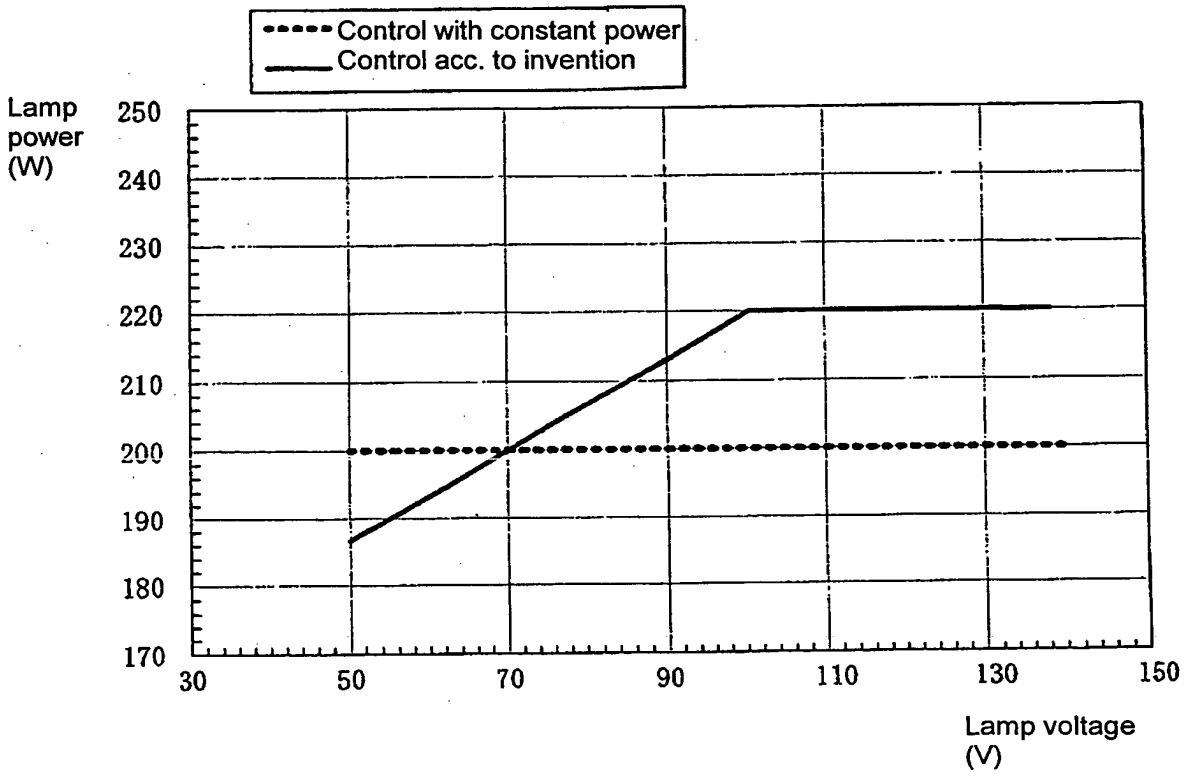

Control with constant power
Control acc. to invention
Lamp power (W)
250
240
230
220
210
200
190
180
170
30
50
70
90
110
130
150
Lamp voltage (V)

Fig. 6

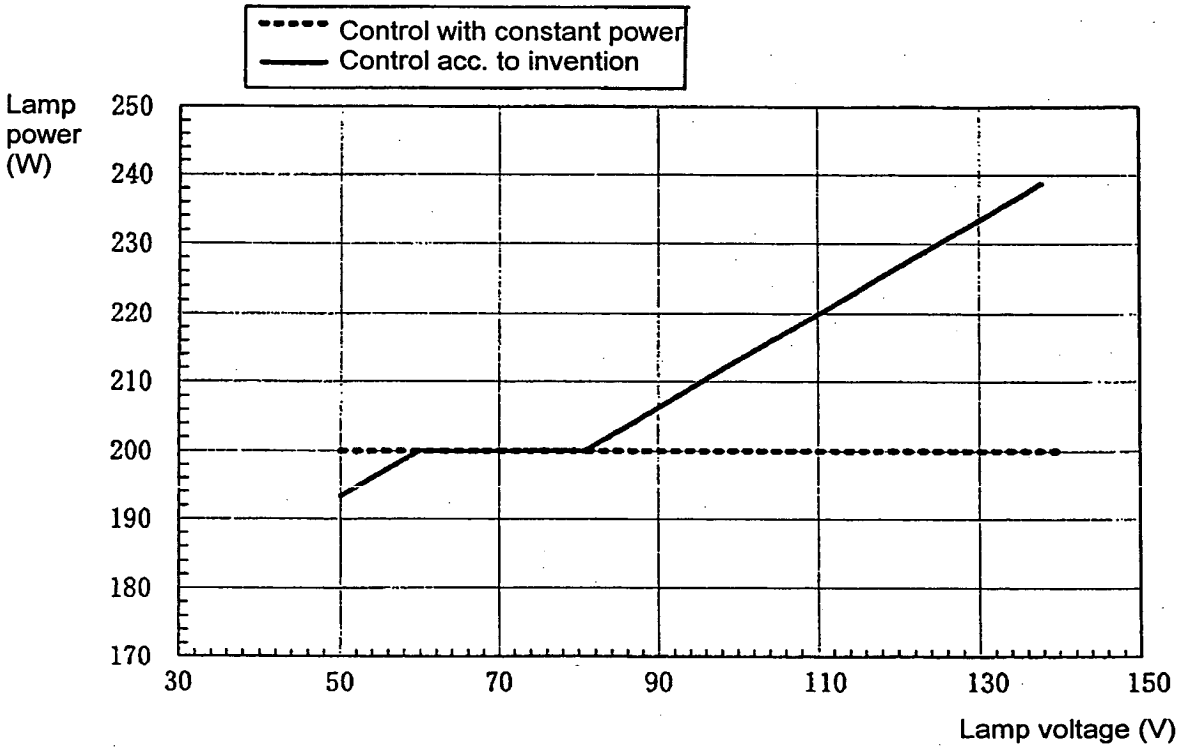

Control with constant power
Control acc. to invention
Lamp power (W)
250
240
230
220
210
200
190
180
170
30
50
70
90
110
130
150
Lamp voltage (V)

Fig. 7

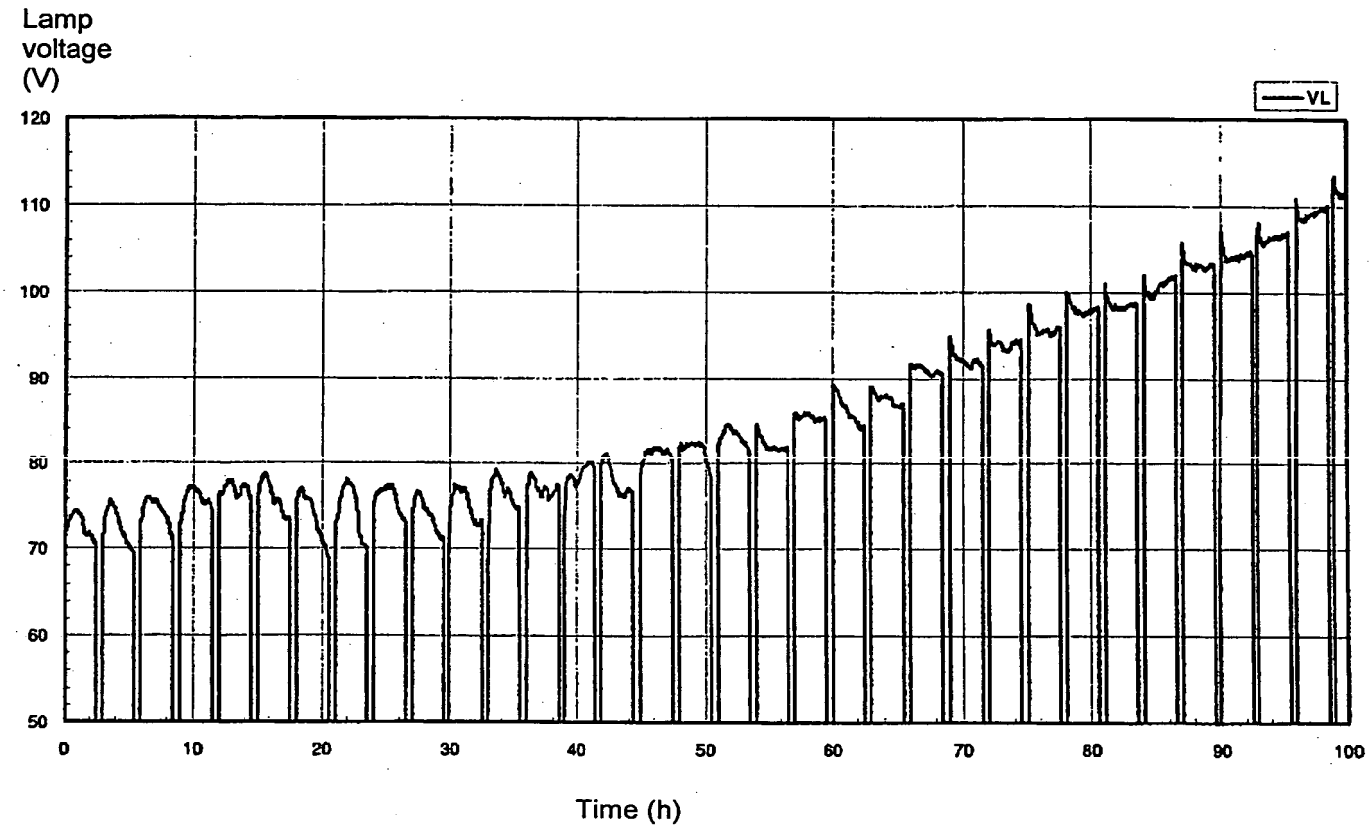

Lamp
voltage
(V)
VL
120
110
100
90
80
70
60
50
0
10
20
30
40
50
60
70
80
90
100
Time (h)

Fig. 8

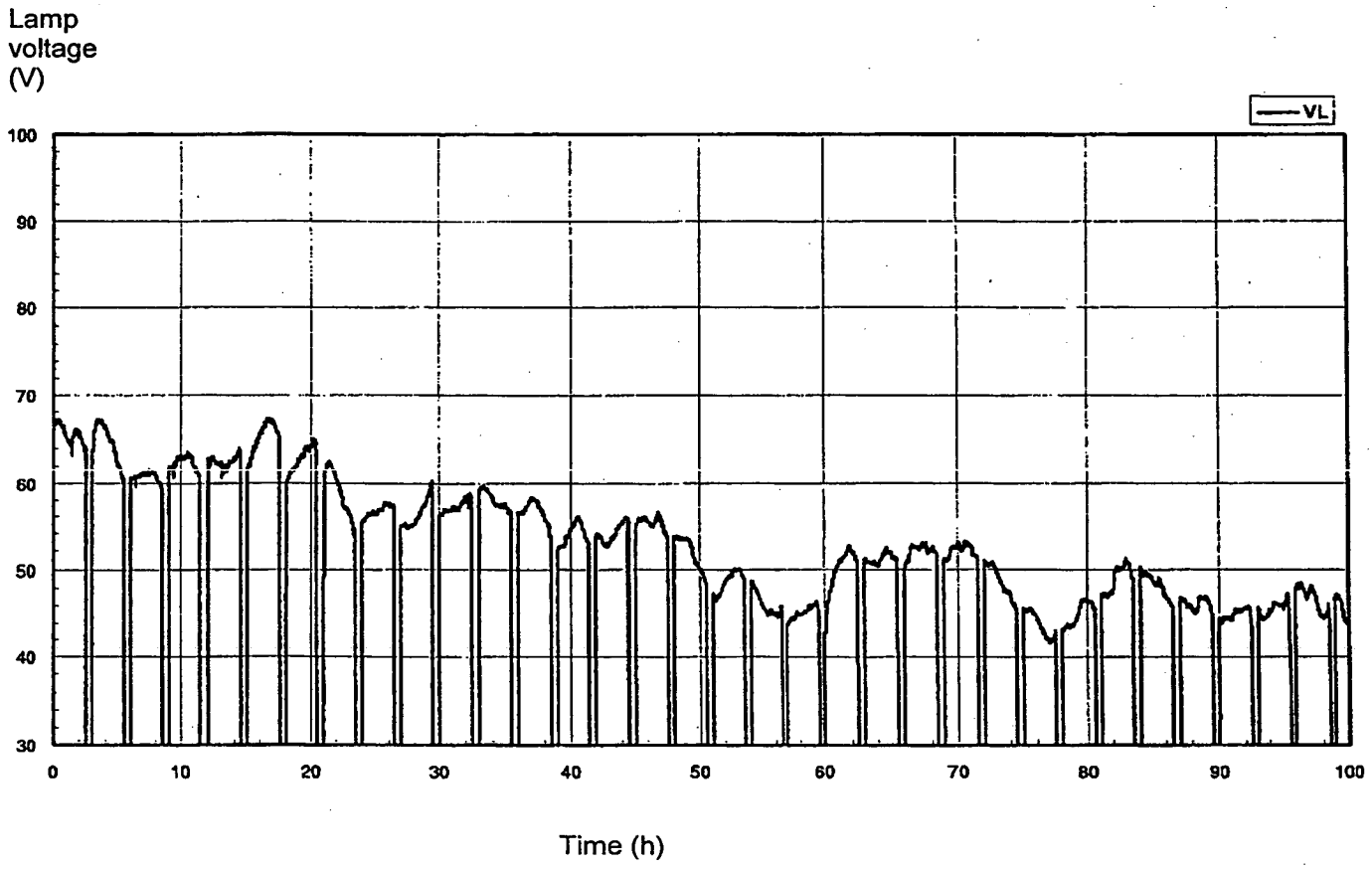

Lamp
voltage
(V)
VL
100
90
80
70
60
50
40
30
0
10
20
30
40
50
60
70
80
90
100
Time (h)

Fig. 9

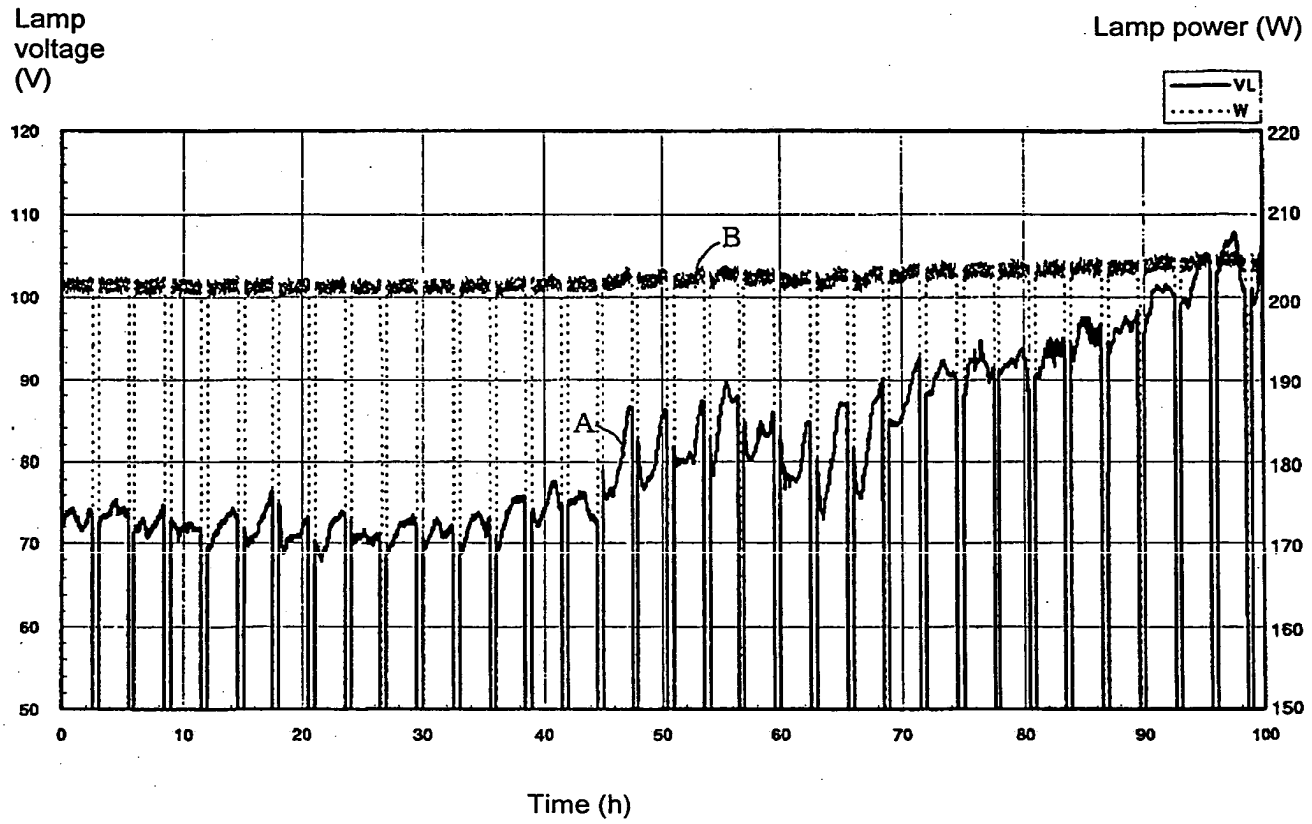

Lamp voltage (V)
Lamp power (W)
VL
W
120
110
100
90
80
70
60
50
220
210
200
190
180
170
160
150
0
10
20
30
40
50
60
70
80
90
100
A
B
Time (h)

Fig. 10

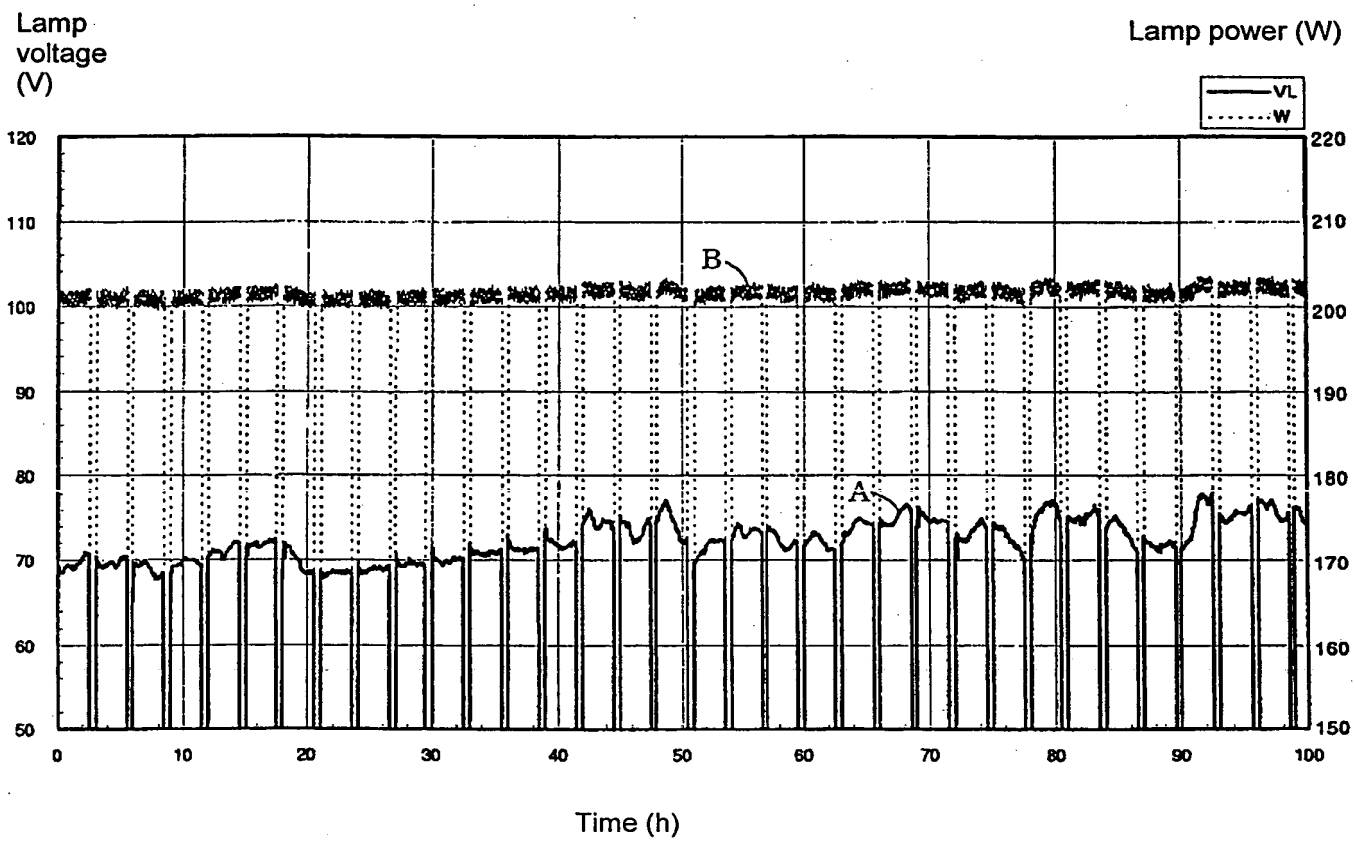

Lamp voltage (V)
Lamp power (W)
VL
W
120
110
100
90
80
70
60
50
220
210
200
190
180
170
160
150
B
A
0
10
20
30
40
50
60
70
80
90
100
Time (h)

Fig. 11

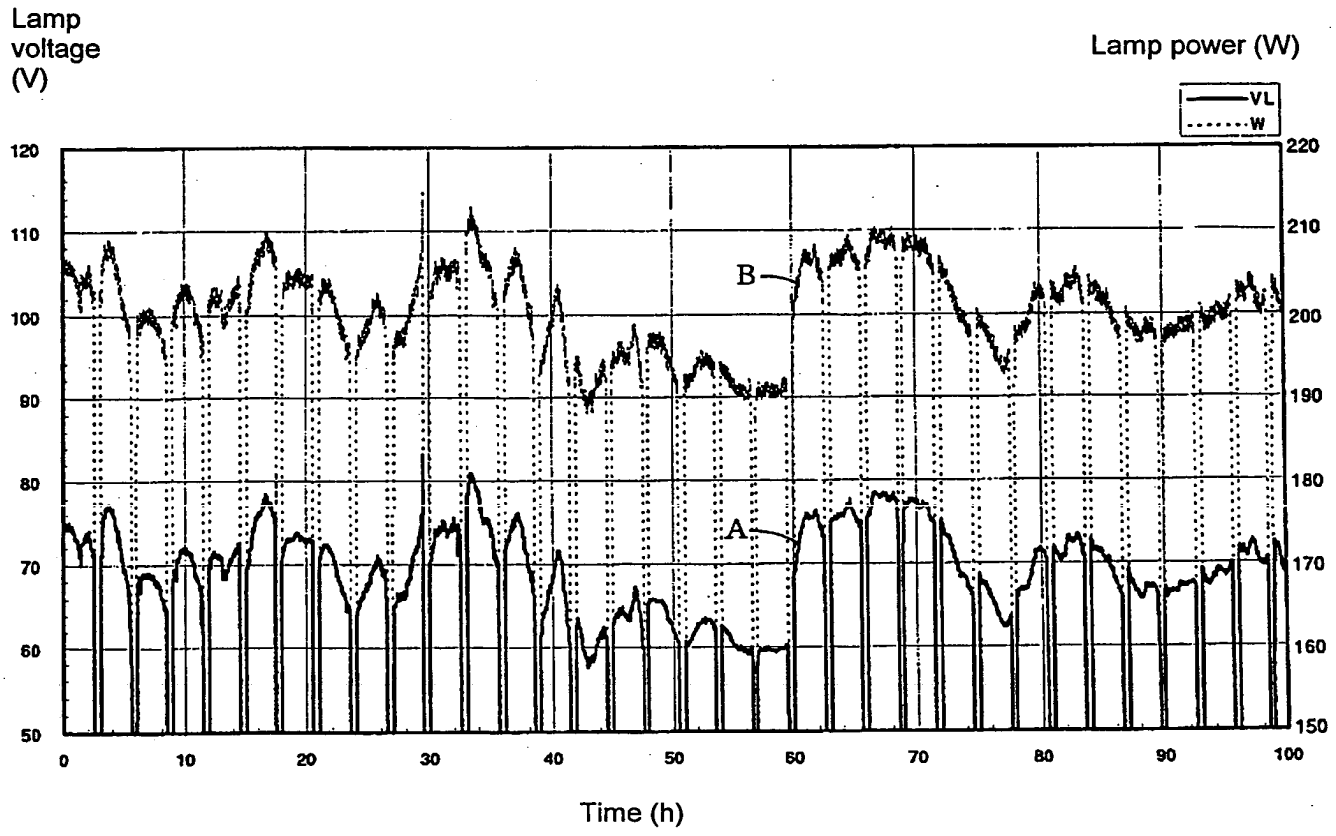
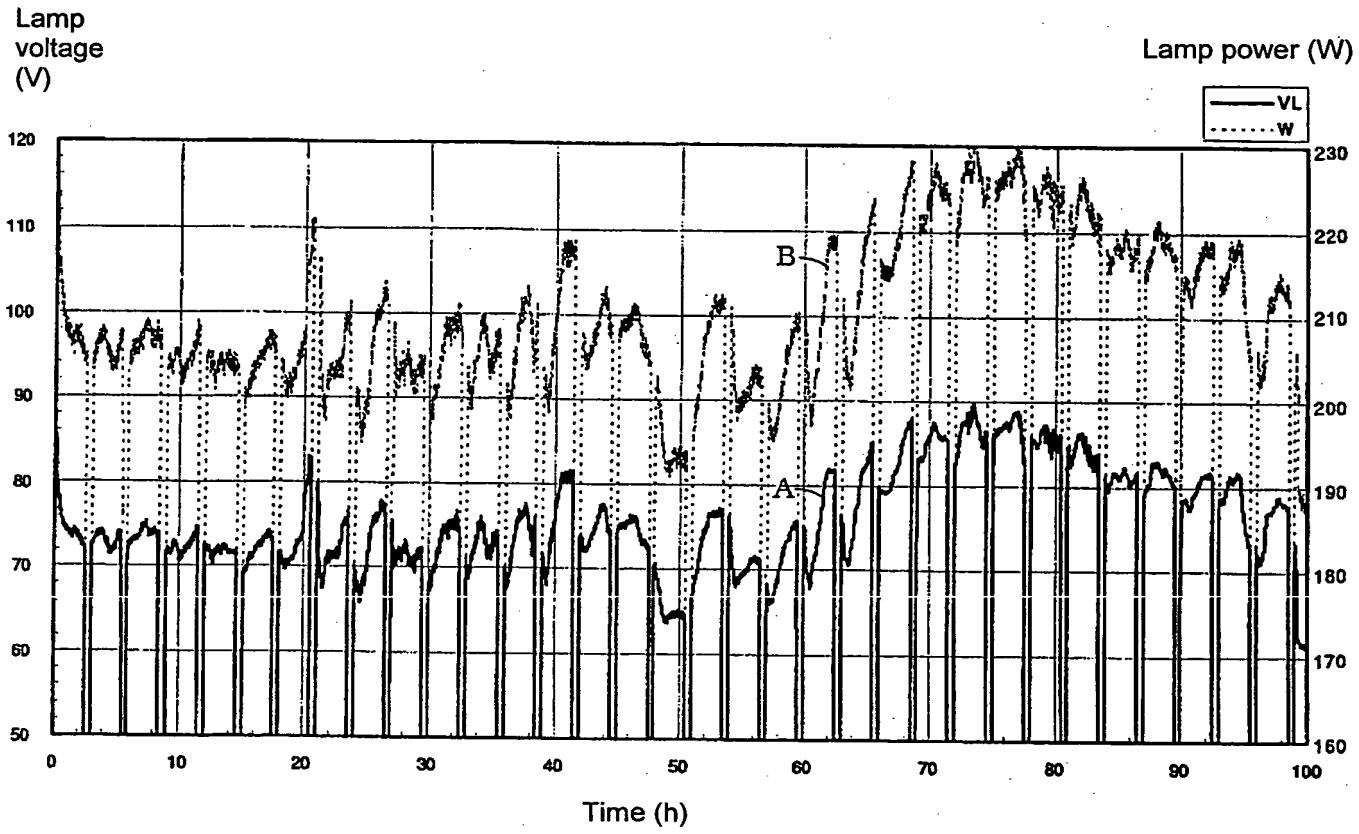

Lamp voltage (V)
Lamp power (W)
VL
W
120
110
100
90
80
70
60
50
220
210
200
190
180
170
160
150
B
A
0
10
20
30
40
50
60
70
80
90
100
Time (h)

Fig. 12


Lamp voltage (V)
Lamp power (W)
VL
W
120
110
100
90
80
70
60
50
230
220
210
200
190
180
170
160
0
10
20
30
40
50
60
70
80
90
100
Time (h)
A
B